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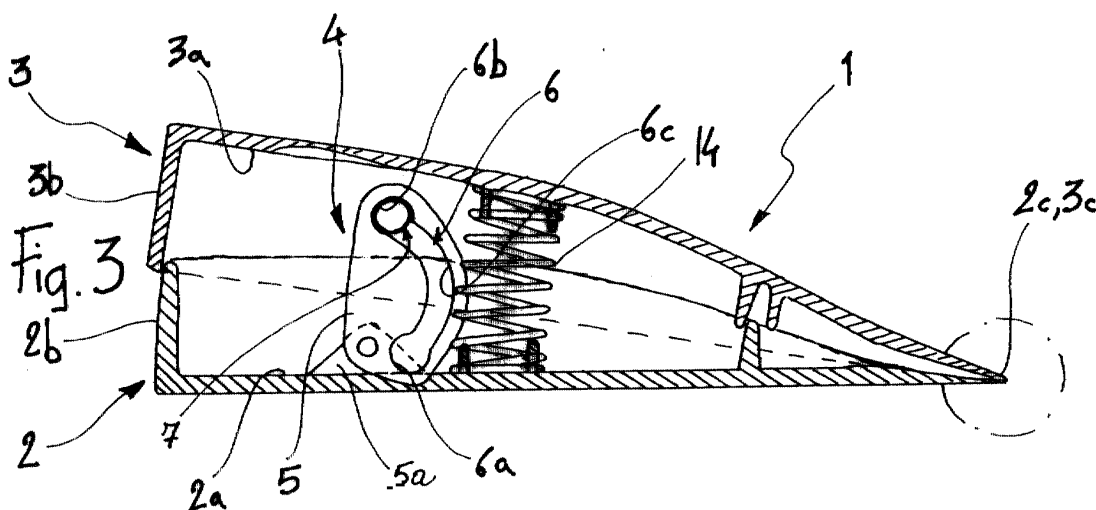
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(54) **A device for adjusting and locking two movably interconnected elements, particularly footwear heels and heel-pieces, and the like**

(57) A device for adjusting and locking a first element (2) and a second element (3) which are interconnected movably, in particular for footwear heels or heel-pieces of adjustable height, comprises spacer means (5) interposed between the first and second elements (2, 3). The spacer means are movable between at least

a first operative position and a second operative position in which the elements (2, 3) are spaced differently relative to one another and locking means (6, 7) are associated with the spacer means (5) in order to lock the elements (2, 3) relative to one another in the operative positions.



Description

[0001] The present invention relates to a device for adjusting and locking movably interconnected elements, according to the preamble to the main claim.

[0002] The invention is directed particularly, but not exclusively towards a device for adjusting and locking two elements making up a footwear heel or heel-piece but may advantageously be used in all applications in which it is desired to achieve adjustment and relative locking between two movably interconnected elements.

[0003] Within the specific field of footwear, a need arises to provide footwear with soles bearing heel regions or heel-pieces of adjustable height. This occurs in particular in the field of ladies' shoes with high heels commonly known as wedges, in which it is desirable to be able to adjust the height of the heel from the ground.

[0004] The main object of the present invention is to provide a device for adjusting and locking, relative to one another, the elements of a heel or heel-piece which are connected to one another with an adjustable height.

[0005] This and other objects which will become clearer from the following description are achieved by the present invention by means of a device for adjusting and locking two movably interconnected elements, formed in accordance with the appended claims.

[0006] The characteristics and the advantages of the invention will become clearer from the following description of a preferred but not exclusive embodiment thereof, described by way of non-limiting example with reference to the appended drawings, in which:

- Figure 1 is a plan view of the device according to the invention, arranged in a footwear heel of adjustable height,
- Figures 2 and 3 are longitudinal sections through the heel of Figure 1, equipped with the device according to the invention, in two distinct operative positions,
- Figure 4 is a section taken on the line IV-IV of Figure 1.

[0007] With reference to the drawings mentioned, a heel portion, generally indicated 1, of a shoe (not shown) is constituted by two movably interconnected elements 2, 3 the relative spacing of which is adjusted by means of a device, indicated 4, formed in accordance with the invention. The device 4 for adjusting and locking the heel elements 2, 3 should be considered to be intended for fitting in footwear heels or heel-pieces in non-limiting manner, since it can advantageously be provided in all applications in which it is desired to be able to adjust the relative spacing of two movably interconnected elements. In the example given below, the device 4 is described as a device for adjusting and locking the elements 2, 3 of the heel 1, with particular reference to a heel for ladies' shoes, of the type commonly known as a "wedge".

[0008] The elements 2, 3 comprise a base 2a and an upper wall 3a, respectively, from which respective side walls 2b, 3b extend. The base 2a is smaller than the upper wall 3a so that the element 2 can be housed entirely in the element 3, as shown in Figure 2. The elements 2 and 3 are articulated to one another along a respective end profile 2c, 3c, so as to be movable, as will be explained further below, between two operative positions, shown in Figures 2 and 3, in which the element 2 is housed entirely in the element 3 (Figure 2) or projects entirely therefrom (Figure 3), respectively.

[0009] The device 4 comprises a pair of plate-like members 5 mounted on the element 2 in parallel and spaced-apart positions. The members are structurally and functionally identical to one another and, for this reason, only one of them will be described in detail. Each member 5 is articulated to the base 2a of the first element 2 by means of a pair of lugs 5a which project from the base 2a and between which the member 5 is articulated about an articulation axis, indicated X in Figure 4.

[0010] The member 5 has a through-hole 6 in the form of an elongate slot in which wider regions 6a, 6b at the opposite ends and a narrower, arcuate, intermediate region 6c are identified.

[0011] The device 4 also comprises a locking pin 7 which can engage the pair of holes 6 and which is mounted in the element 3 so as to be slidable axially along an axis parallel to the axis X. The pin 7 comprises, starting from one of its ends, a cylindrical portion 8 which is supported in the element 3 and projects therefrom and the function of which will be explained below, a first cylindrical portion and a second, cylindrical portion 9, 10, which are coaxial, the first portion having a smaller diameter than the second portion, as well as a third portion and a fourth portion 9a, 10a, having diameters equal to those of the portions 9 and 10, respectively. The fourth portion 10a is partially housed and supported in a seat 11 of the second element 3 constituting a seat for housing a spring 12. A coaxial cylindrical appendage of smaller diameter, adjacent the fourth portion 10a of the pin, is indicated 13 and has the function of a guide for the spring 12.

[0012] The pin 7 is mounted in the element 3 in a position such that it can engage the end region 6a or 6b of each hole 6 releasably by means of the portions 10, 10a (of larger diameter) or can be housed slidably in the intermediate region 6c of each hole 6 by means of the respective portions 9, 9a.

[0013] In Figure 2, the device 4 is shown in a first operative position in which the pin portions 10, 10a are restrained in the respective wider regions 6a of the holes 6 which are nearest to the point of articulation of the member 5 about the axis X. In this first operative position, as a result of the restraint of the pin 7 in the holes 6, the elements 2 and 3 are locked relative to one another with the element 2 housed entirely in the element 3. It will be noted that the pin 7 is urged resiliently into engagement with the regions 6a of the holes 6 by the

spring 12. A second spring, indicated 14, acts between the elements 2 and 3 in order to urge the element 3 away from the element 2. In the first operative position, the spring 14 is compressed between the elements 2 and 3 of the heel 1.

[0014] Starting from this first operative position, as a result of an external pressure on the cylindrical portion 8 of the pin 7 (which thus acts as a push-button), against the action of the spring 12, the pin 7 is released from the regions 6a of the holes 6 until the portions 9, 9a of smaller diameter are housed in the intermediate regions of the holes 6, thus permitting relative sliding between the pin 7 and the holes 6. By means of this relative sliding, which is facilitated by the resilient action of the spring 14, the plate-like members 5 are pivoted (clockwise in Figures 2 and 3), moving the elements 2 and 3 apart, towards the second operative position of Figure 3. In this position, the release of the portion 8 (facilitated by the action of the spring 12) causes the portions 10, 10a of the pin 7 to be engaged in the respective larger regions 6b of the holes 6, consequently locking the pin 7 relative to the holes 6. As a result, the elements 2 and 3 are locked relative to one another in the position of Figure 3 in which the element 2 has moved away and projects almost entirely from the element 3. In this case, the overall height of the heel 1 is approximately equal to the sum of the heights of the elements 2 and 3.

[0015] In order to return the device 4 to the first operative position, it suffices to release the pin 7 from the wider regions 6b again, against the action of the spring 12, and to push the element 3 towards the element 2, against the spring 14, until the operative position of Figure 2, in which the element 2 is housed entirely in the element 3, is reached. It will be noted that, in the first operative position, the height of the heel 1 is substantially equal to the height of each individual element 2, 3.

[0016] The device of the present invention thus enables the height of the heel 1 to be adjusted and locked at the heights which can be reached in the first and second operative positions, respectively, in which one of the heights is approximately twice the other.

[0017] The invention thus achieves the objects stated, affording the advantages indicated above.

Claims

1. A device for adjusting and locking a first element (2) and a second element (3) which are interconnected movably, in particular for footwear heels or heel-pieces of adjustable height, comprising spacer means (5) interposed between the first and second elements (2, 3), characterized in that the spacer means are movable between at least a first operative position and a second operative position in which the elements (2, 3) are spaced differently relative to one another, locking means (6, 7) being associated with the spacer means (5) for locking the

elements (2, 3) relative to one another in the operative positions.

2. A device according to Claim 1, in which the spacer means comprise at least one plate-like member (5) articulated to the first element (2) so as to pivot between the operative positions, the member (5) comprising an elongate slot-like hole (6) which can be engaged slidably by a first portion (9, 9a) of a pin (7) fixed to the second element (3) so as to guide the second element between the operative positions by the sliding of the first portion of the pin (7) in the hole (6).

3. A device according to Claim 2, in which the locking means comprise, at the opposite ends of the hole (6), regions (6a, 6b) which are wider than a narrower, intermediate region (6c), and a second portion (10, 10a) of the pin which has a larger diameter than the first portion (9, 9a), the second portion being capable of being restrained in one or other of the wider regions (6a, 6b) in order to lock the first and second elements (2, 3) relative to one another in the first and second operative positions, respectively.

4. A device according to Claim 3, in which the first portion (9, 9a) and the second portion (10, 10a) of the pin (7) are coaxial and the pin (7) is mounted slidably in the second element (3) so as to engage the wider regions (6a, 6b) of the hole (6) releasably by means of the second portion (10, 10a), and to be engageable for sliding in the intermediate region (6c) of the hole by means of the first portion (9a, 9a).

5. A device according to Claim 4, in which first resilient means (12) are provided and act on the pin (7) in order to urge the pin (7) into a condition in which the second portion (10, 10a) is engaged in one or other of the wider regions (6a, 6b) of the hole (6), push-button means (8) being provided on the pin (7) for releasing the pin (7) from the wider end regions (6a, 6b) of the hole, against the first resilient means (12).

6. A device according to one or more of Claims 2 to 5, in which the intermediate region (6c) of the hole (6) is arcuate.

7. A device according to one or more of the preceding claims, in which second resilient means (14) are provided and act between the first element (2) and the second element (3) in order to urge the elements towards the second operative position.

8. A device according to one or more of Claims 2 to 7, in which the spacer means comprise a pair of the said plate-like members (5) each having a respective hole (6), the pin (7) having respective first portions (9, 9a) and second portions (10, 10a) of differ-

ent diameters, which can be engaged in the corresponding holes (6).

9. A device according to one or more of the preceding claims, in which the first element (2) and the second element (3) are elements of a footwear heel or heel-piece (1).

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